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Entrepreneurial human capital accumulation and the growth of rural businesses: a four-country survey in mountainous and lagging areas of the European union

Dimitris Skuras[a,*], Nicolas Meccheri[b], Manuel Belo Moreira[c], Jordi Rosell[d], Sophia Stathopoulou[a]

[a] *Department of Economics, University of Patras, University Campus, Rio, P. O. Box 1391, Patras 26500, Greece*
[b] *Department of Economics, University of Pisa, Italy*
[c] *Department of Agrarian Economics and Rural Sociology, Instituto Superior De Agronomia, Portugal*
[d] *Department of Applied Economics, Fundacio Empresa I Cienca, Spain*

Abstract

The paper presents the processes of entrepreneurial human capital accumulation and its impact on rural business growth. Data are derived from four surveys on rural businesses in mountainous and less favoured areas in Southern Europe. Formal pathways of entrepreneurial human capital accumulation refer to education and training, while informal pathways include the cognitive processes of work and managerial experience acquisition and the non-cognitive processes of being raised within an entrepreneurial family environment and/or being raised in the area within which the business is later set-up. The studies reveal that there is a variety of processes of entrepreneurial human capital and knowledge accumulation that are case study specific. Human capital accumulation processes related to education and training or to work and managerial experience still plays the prime role in predicting successful businesses. Results indicate the need for decentralised, flexible and selective entrepreneurial human capital accumulation support programmes that take into account local idiosyncrasies and needs.
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1. Introduction

Entrepreneurial human capital refers to the skills and knowledge acquired by an entrepreneur. Human capital determines the ability of a business owner not only to recognise an economic opportunity but also to exploit it efficiently by setting up a venture. The importance of human capital has been acknowledged as one of the main factors influencing the set-up and growth of successful enterprises in remote and lagging areas in the European Union's (EU's) rural milieu. Small businesses operating in the EU's most peripheral areas constitute an integral part of the rural space and the major alternative to agricultural employment, and thus creating and supporting rural businesses is considered a primary strategy for the survival and integrated development of these areas. Rural development policies have focused on instruments to support and enhance entrepreneurial human capital, alongside schemes to finance and foster the creation and growth of rural businesses. As a result, a bulk of schemes provides the opportunities for entrepreneurial education and training, as well as for financing business start-up. However, most schemes and policy instruments concentrate their efforts on what may be considered formal and conventional, and thus fail to provide more flexible and unconventional instruments of entrepreneurial human capital development. This may be attributed first, to a partial and limited understanding of the role and function of human capital in enterprise development, and second, to the difficulty in conceiving, designing and launching more complex schemes supporting entrepreneurial human capital development.

In this work, we propose a theoretical framework of entrepreneurial human capital accumulation through a process that contains both formal and informal elements. The importance of each of these elements that

*Corresponding author. Tel./fax: +30-2610-996130.
E-mail address: skuras@econ.upatras.gr (D. Skuras).

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contribute to human capital accumulation and result in the creation of successful and growing businesses is assessed through a case study that involved 513 business owners in remote and mountainous areas in four countries in Southern Europe.

While many informal factors contributing to human capital accumulation have been empirically researched, the results are often partial, touching upon only a few of the processes leading to the accumulation of entrepreneurial human capital, and thus fail to address the issue within an integrated theoretical framework. The contribution of the present work lies in an attempt to illustrate how entrepreneurial human capital is accumulated in order to function as a mechanism to establish and develop successful ventures. Thus, the main objective of this work is to record the pathways of human capital accumulation across areas of the EU in a coherent and systematic way, to illustrate similarities and differences and reveal, mainly, the diversity and dynamics of informal human capital accumulation processes in the rural space. Such diversity calls upon the design and execution of localised, bottom-up entrepreneurial development strategies that can launch flexibly tailored combinations of support addressing the local/regional features of enterprise development, and it is of importance especially to practitioners and local and regional policy makers.

2. Entrepreneurial human capital and the growth of rural businesses

The human capital procedure includes all these processes that contribute to higher levels of knowledge and assign the entrepreneur with a competitive advantage in establishing and operating a successful venture. Johnson et al. (2002) argue that individual-entrepreneurial knowledge consists of four distinct types of knowledge, namely, 'know-what', 'know-why', 'know-how' and 'know-who'. Know-what refers to the knowledge of facts, know-why refers to the knowledge of principles and laws of motion in nature, in the human mind and in society, know-how refers to skills and competencies and, in turn, the ability to do something. Finally, know-who refers to the knowledge of who knows what and who knows what to do and, because it involves the social ability to co-operate and communicate with different kinds of people and experts, it is highly context dependent and reliant on social capital in terms of trust and networks. On an organisational level, these categories of knowledge correspond to 'shared information databases', 'shared models of interpretation', 'shared routines' and 'shared networks'.

In another context, Storper (1997, p. 41) refers to learning economies as an ensemble of competitive possibilities, reflexive in nature and engendered by capitalism's new metacapacities, and also as the risks or constraints manufactured by the reflexive learning of others. In that context, learning economies are based on cosmopolitan and non-cosmopolitan knowledge. Cosmopolitan knowledge is the knowledge that is accessible in a highly reproducible form and, thus, it is based on codification and standardisation that, in turn, allow for imitation and diffusion. Non-cosmopolitan knowledge is the knowledge that is embedded in particular concrete relations or cultures, which enable their members to access or to interpret knowledge and information or apply it in a useful way (Storper, 1997, p. 70), a kind of knowledge that would, in some sense, coincide with tacit knowledge.

It is important to note that non-cosmopolitan knowledge as opposed to cosmopolitan knowledge gives rise to de-standardisation and variety as opposed to standardisation and generic knowledge, to the creation of asymmetric knowledge as opposed to diffusion and to non-codification as opposed to codification. Cosmopolitan and non-cosmopolitan knowledge permit entrepreneurs to perceive, interpret and use information and conventions in their transactions with other economic and social agents. Conventions include taken-for-granted, mutually coherent expectations, routines and practices, which are occasionally manifested as formal institutions and rules (Storper and Salais, 1997). An account of the meaning and operation of conventions in a rural context is provided by Murdoch and Miele (1999).

Tacit knowledge is regarded as highly localised and contextual, while codified knowledge is thought of as being placeless. Recent work, however, stresses the fact that localised learning is also based on 'sticky' codified knowledge which when combined with place-specific and experience-based tacit knowledge and competence creates 'disembodied' knowledge, implying that some codified knowledge may be a product of localised rather than placeless learning (Asheim and Isaksen, 2003). Disembodied knowledge and the stickiness of some forms of knowledge and learning processes (Malmberg, 1997; Markusen, 1996) are particularly important when rural lagging areas are examined, because they reveal the importance of knowledge which is codified in local rather than universal codes (Lundvall, 1996), and effectively challenge the idea that the global availability of new production technologies and organisational designs at more or less the same cost (what has been termed 'ubiquitification') will undermine the competitiveness of firms in the high-cost areas of the world (Malmberg and Maskell, 1999).

One should note, however, that what is and what is not codified (cosmopolitan) knowledge, and how much and what can be actually codified is a highly debatable issue (Cowan et al., 2000; Johnson et al., 2002) and largely out of the scope of the present work. For this

reason, we deal with the processes leading to knowledge accumulation, and not directly with the type of knowledge acquired, which is the subject of a still open and ongoing discussion. Thus, in the present work, we adopt a tree process of entrepreneurial human capital accumulation, shown in Fig. 1. Human capital accumulation processes are basically divided into formal and informal ones, with formal processes referring to institutionalised education and training. Informal processes are further divided into cognitive and non-cognitive processes. Cognitive processes refer to comprehensive human capital accumulated through knowledge acquired by work experience or by running another business. In cognitive processes, the entrepreneur is an active and learning part of the process.

Non-cognitive processes refer to human capital acquired and accumulated spontaneously. They occur when the entrepreneur is a passive member of the human capital accumulation process, a member who receives and stores information, images and experience, which he may process and utilise at a future time. Non-cognitive processes should be sought in the entrepreneur's past, and may refer to his being raised in an entrepreneurial environment, with at least one of the parents being an entrepreneur, or may refer to his being born and bred in the area. Formal processes can be thought of as being antecedents to entrepreneurial competencies, while informal processes are tasks and behaviour leading to such competencies. Both formal and informal human capital accumulation processes assist the entrepreneur to achieve standards of competencies in a wide range of entrepreneurial functional areas, such as finance, management and marketing. Fig. 1 does not aim to be inclusive of all the processes leading to human capital accumulation, but rather to show an indicative range of working paradigms.

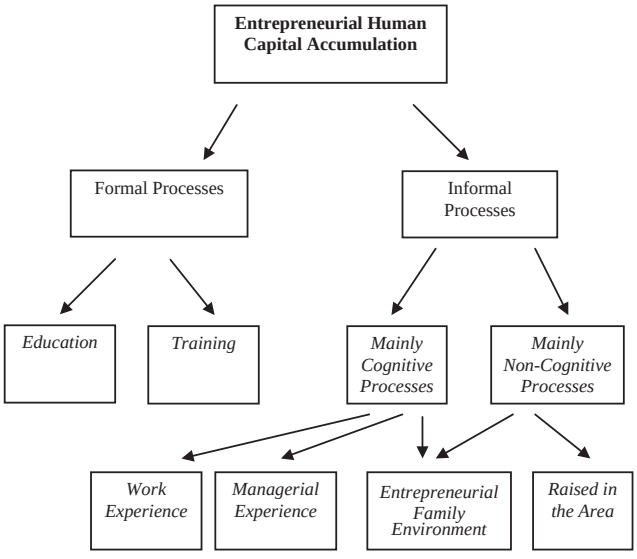

Fig. 1. An indicative tree diagram of human capital accumulation processes.

It is out of the scope of this work to refer extensively to the operation and impact of formal processes, as these have long been established and extensively documented in the economics and management literature and are widely acknowledged as the main factors of individual, regional and national prosperity (OECD, 2001). Education and training are significant entrepreneurial variables related to knowledge, skills, motivation, self-confidence and the ability to provide solutions to short- and long-term business planning issues. Formal processes of human capital accumulation aim at stimulating creativity, curiosity, open-mindedness and good interpersonal skills, all contributing to innovativeness and entrepreneurship. Formal education and training provide the entrepreneur with 'know-what', 'know-why', 'know-how' and 'know-who' (Lundvall and Johnson, 1994).

Research concerning training programmes and the impact of training on rural entrepreneurs is limited. Gale (1999) reports on training needs and suppliers of training in rural manufacturing. Bennett and Errington (1995) argue that many enterprises located in rural areas have difficulties accessing and implementing training programmes, a fact that is attributed to a variety of factors, such as the geographical dispersion and the small size of rural enterprises, inadequate means of transportation, the high level of self-employment in rural areas and the fact that training agencies are located in urban regions. On the other hand, urban businesses are more likely to reduce their dependence on labour skills and training programmes by becoming more capital intensive or by trying to externalise their production activities (North and Smallbone, 1996). In rural areas, training programmes, such as the school-to-work programmes, can be most useful to small local manufacturers, who cannot develop their own training policy. Those localities that indeed provide such training programmes are more likely to turn out a more competitive manufacturing sector (Illouz-Winicki and Paillard, 1998).

Work experience lies at the boundaries of formal and informal processes, as it may be part of a coherent formal education or training course, or a stand-alone activity. Experience can be either direct or indirect. An individual may acquire the former when he is actually involved in the start-up of a new business venture. The latter is acquired when the individual works for another employer or is part of the family business. Work experience may be industrial, managerial and entrepreneurial. Industrial experience in a similar job provides an entrepreneur with advantages, because he gains knowledge of products, production factors and methods of production, knowledge of specific industry regulations, labour relations, customer and supplier relations,

knowledge of a variable degree of network to suppliers, customers and lenders, as well as the ability to recognise challenges and evaluate and manage risk. Previous experience in a different business may not provide the entrepreneur with the same advantages, but nevertheless, it still offers the so-called 'task similarity' concerning skills, knowledge, management and general abilities (Chandler and Hanks, 1991).

Managerial experience refers to the experience gained by running a business, while entrepreneurial experience refers to the experience gained by establishing and running a business. However, in micro and small rural businesses, the entrepreneur is usually both the owner and manager of the firm, and thus there is no sharp distinction between managerial and entrepreneurial experience. If an owner-manager has been involved in starting a business before, in his past life, this will shed light into the so-called 'entrepreneurial learning'. Such an experience is of service to the individual when starting a new venture, as she/he is already aware of the dangers and the problems that she/he will face once the new business is established, while past mistakes that may have led the older business to failure can become a valuable lesson. One may argue that experience in prior ventures affords the successful entrepreneur with the sweet taste of independence, creativity, innovativeness, control and leadership, while the closure of prior businesses brands the entrepreneur with the 'stigma' of failure, and does not easily facilitate another venture. The importance of work and/or managerial experience on 'entrepreneurial learning', in general (Cope and Watts, 2000; Rae, 2000), on the growth of business (Bird, 1993; Chandler and Hanks, 1991; Cooper et al., 1994; DeChiara, 1998) and opportunity identification in specific (Ardichvili et al., 2003; Davidsson and Honig, 2003) are well documented, leading researchers to suggest that mentoring from previous or existing entrepreneurs would highly enhance the entrepreneurial learning of new entrepreneurs (Cope and Watts, 2000; Sullivan, 2000).

The entrepreneurial family environment facilitates both cognitive and non-cognitive processes of human capital accumulation. It may serve as a niche of conscious processes through work experience and participation in the family decision-making, or it may enable the entrepreneur to unconsciously collect information and images that he may consciously process at a later time and according to need. Thus, entrepreneurs raised in an entrepreneurial family background are aware of the challenges they will have to face, and are better prepared to seek and give solutions to the problems that will arise. However, the most important contribution of an entrepreneurial family background to the entrepreneur's competencies lies in the opportunity to access informal and formal networks of suppliers, clients and venture capitalists, of which she/he can take advantage. Several studies have provided empirical evidence to the argument that an entrepreneurial family background increases the likelihood of setting up a successful small venture (Lerner and Haber, 2001).

This feature of an entrepreneurial family background, together with the non-cognitive process of human capital accumulation occurring when the entrepreneur has been raised in the area, are directly linked to the conception of entrepreneurship as an embedded socio-economic process (Stathopoulou et al., 2004). Embeddedness in the social structure creates entrepreneurial opportunity and improves performance (Jack and Anderson, 2002). Fukuyama's (1995) investigation into the relations of social capital to economic development pointed to the fact that economic prosperity can be accounted for by the individualistic, utility-optimising, rational decision-maker paradigm, only 80% of the time. The remaining crucial 20% depends on the role of social capital rooted in people's need of norms and rules binding them to others. Fukuyama's thesis that social capital as trust reduces transaction costs has already been provided with empirical evidence demonstrating the importance of weak ties, i.e., relationships based on family, and/or friendship and trust, for the growth of small ventures (Brüderl and Preisendörfer, 1998; Donckels and Lambrecht, 1995). Thus, an entrepreneur's congruence with the social structure is significantly affected if she/he has been raised in an entrepreneurial family environment and, to a lesser extent, if she/he has been raised in the area.

Within the framework presented at the beginning of this section, about the types of entrepreneurial knowledge, formal processes of entrepreneurial capital accumulation represent, to a large extent, the acquisition of highly codified, and hence non-culture-dependent, cosmopolitan, scientific or professional knowledge. On the other hand, informal processes of entrepreneurial capital accumulation refer to the acquisition of both cosmopolitan and non-cosmopolitan (tacit) knowledge, but are the only ones leading to a territorially specific and idiosyncratic learning of local conventions.

Human capital accumulation is only a means to an end, that is, it leads to the establishment of successful ventures and, consequently, controls the performance of the established firm. The definition of successful business performance is a controversial issue in business economics, largely due to the multidimensional meanings and goals that have been assigned to entrepreneurship. Murphy et al. (1996) work has provided the most complete account of the changing meaning and measurement of performance in entrepreneurship research up to the mid-1990s. Where micro and small businesses are concerned, defining and measuring firm performance is an extremely difficult task, due to mainly two reasons: first, the absence of valid financial indicators on which conventional measures of firm performance may be

calculated; second, because of the multidimensional nature of entrepreneurial objectives, mere firm financial performance may not be the sole, and often not the primary, entrepreneurial target.

3. Case studies and data

3.1. Case studies

Four case study areas, one in each country (Greece, Italy, Portugal and Spain), were selected. All areas are mountainous, generally secluded from the main centres of economic activity and suffering from several development constraints. At the administrative level, the Greek study area of Evrytania is a prefecture (NUTS III area); the Italian area comprises two local economic systems at Valle del Serchio, a sub-regional level lower than NUTS III that is part of the Province of Lucca; the Portuguese area in Serra Algarvia does not have an autonomous administrative status, but is a part of the NUTS III area of the District of Farro; and the Spanish area of Garrotxa is a county, belonging to the NUTS III area of the Province of Girona.

The Greek case study area of Evrytania has been historically characterised by remoteness and harsh climatic conditions. The mountainous character of the prefecture has been the most important factor behind the significant backwardness of the area in terms of transport infrastructure. The unfavourable population structure of Evrytania has contributed, at least until very recently, to low rates of economic growth, and constraints regarding entrepreneurial capacity and the existence of skilled labour. The access difficulties and the small size of the local market have prohibited the development of a dynamic secondary sector, resulting in the presence of small-scale traditional units. On the other hand, Evrytania is also characterised by significant strengths, most of which are based on the area's endogenous physical resources. The features, which have caused isolation, have, at the same time, contributed to the area's status as a place of natural beauty, ecological diversity and unspoiled natural environment. These strengths have created a strong potential for all-year-round tourism, amenity and recreational activities, the production of local quality goods and, therefore, for the utilisation of local resources (forests, traditional crafts, agricultural products, etc.).

The study area of Valle del Serchio is another mountainous region facing considerable development constraints. The area is characterised by a clear polarisation phenomenon, with Media Valle del Serchio being in a good position and the sub-area of Garfagnana facing significant development problems. The whole area can be characterised as quite secluded, but Garfagnana is much more so. De-population in the area cannot be regarded as very high; however, population decline still continues. Incomes cannot be regarded as exceptionally low (as in Evrytania), but welfare indices portray the marginalisation of Garfagnana. Despite the recent growth in tourism, the area is still constrained by the existence of low-quality facilities, especially in Garfagnana. On the other hand, the whole area is characterised by several strengths that seem to influence the development of local businesses. The potential of tourism development is the most important of them, and can be attributed to the existence of rich natural and cultural resources, while the traditional industrial character of the area is another positive factor for local development.

Serra Algarvia in Portugal is an area with several important socio-economic weaknesses and development constraints, quite similar to those of Evrytania. The area is remote and difficult to access. As a result, economic activity has traditionally been rather weak and incomes are low, resulting into de-population, and the existence of unfavourable age structures. Agriculture is still very important in the area, but presents problems of low productivity. Manufacturing is rather weak and is characterised by the existence of small-scale, traditional units. On the other hand, the rich recreational tourism potential of the area has led to the gradual development of a tourism-related economic activity, which clearly constitutes the best available prospect for the development of local businesses and entrepreneurship.

Finally, the Spanish study area of Garrotxa seems to be associated with (perhaps) the most favourable characteristics compared to the rest of the study areas. Garrotxa is quite a remote area in terms of distance from major urban centres, but links with the rest of Spain are quite satisfactory. The age structures are not really problematic, while the local labour force can be characterised as rather skilled. Despite the small size of the market and the existence of small units in certain manufacturing sectors, the industrial and entrepreneurial tradition of the area has resulted in positive trends regarding economic growth and local incomes. Again, the environmental richness and cultural identity of the area have resulted in the recent growth of tourism and, thus, in the existence of entrepreneurial development in several related sectors. Map 1 shows the location of all

Map 1. The location of the case study areas.

case study areas in the four countries. Skuras et al. (2003a) provide a detailed comparison of the four case study areas, based on key macro and regional socio-economic and physical characteristics.

3.2. Data

Firms were sampled in the four case study areas according to a sampling design stratifying firms by sector and size. Sampling frames were obtained from local chambers of manufacturing and commerce or other relevant authorities and institutions. A questionnaire aiming to collect business information was designed, pre-tested and translated into the four national languages. After conducting a pilot survey, certain minor adjustments were made to the questionnaire, and personal interviews conducted by trained personnel started in the second half of 1999 and were completed in the first half of 2000. The sample size anticipated a maximum of 150 firms in each case study area, but only a total of 513 firms were sampled from all the case study areas. The sample is representative of the distribution of firms in the case study areas with a slight over- or under-representation in certain areas and sectors that does not, however, disturb the representative nature of the sample. Table 1 shows the sectoral distribution of the sampled enterprises in the four case study areas. Enterprises are mostly family businesses, operated by the entrepreneur and one member of his/her family, usually a husband or wife.

Business performance and business growth may be captured by basically two kinds of measures, factual and perceptual. Factual measures are constructed by hard facts and data that are reproducible and testable. Perceptual measures are based on entrepreneurial responses about various dimensions of firm performance that are embedded in the entrepreneur's perceptions, attitudes and interpretations. Perceptual measures are very sensitive to the context within which they are measured, are difficult to apply at cross-national surveys conducted in different languages and may be debatable and inaccurate. Therefore, we decided to concentrate on factual measures of business performance and growth. Factual measures may be derived from financial data, e.g., value of turnover, assets, net profits, etc., or from data concerning the firm's size in terms of employed labour, physical output, market share, etc.

Financial data may yield very interesting measures concerning financial performance, e.g., the return on assets (ROA), profitability, e.g., profit margins, growth, e.g., growth of sales, and leverage (liquidity measures, etc.). However, the quality and validity of financial data, especially when micro and small businesses are concerned, are highly questionable. Most small businesses are not legally obliged to publish book value data, and thus financial data collection in this case depends solely upon the firm's disclosure policy. However, even if the entrepreneur is willing to provide data, there is always the risk of getting intentional or unintentional false answers, as the researcher has not the opportunity to cross-validate the quality of the derived data.

Thus, it was decided to measure performance in terms of labour growth, because the size of the business in terms of employment 5 years before the survey was conducted and at the time of the survey could be and was confirmed by the official records kept in the local offices of employment and tax registry. Furthermore, measuring business growth in terms of employment (and thus, indirectly, in terms of job creation potential) is directly linked to rural development objectives and relevant to policy decisions (Skuras et al., 2003b). Missing data are due to either respondents being unable to recall critical information or to the fact that we were unable to trace records of certain businesses, and thus unable to cross-validate the responses. Accordingly, therefore, we were able to measure business growth in terms of the growth of actual annual work units and in terms of the percentage growth.

However, the reader of this work should bear in mind that measuring business growth and success in terms of labour growth is not free of problems. Employment growth is very sensitive to entrepreneurial objectives and the characteristics of rural business. For example, entrepreneurial objectives may refer to economic targets, such as improving profit margins or maintaining a higher level of liquidity, or they may refer to non-economic success, such as exercising influence over the local community or maintaining a certain life style. These targets are not directly or necessarily linked to higher employment levels. Furthermore, the growth of employment depends on the entrepreneurs' perception of the wider economic situation, and they seem reluctant to hire more labour before they are assured of at least a medium or long-term horizon in the foreseen growth. Finally, employment growth depends on the sector of economic activity and the size of the business. There are

Table 1
The distribution of surveyed businesses by sector of economic activity (%)

	Case study area in:			
	Greece	Italy	Portugal	Spain
Manufacturing sector:	21.2	31.7	15.5	59.0
Agro-food	9.8	2.4	5.8	19.0
Other manufacturing	11.4	29.3	9.7	40.0
Construction	3.0	7.3	1.3	0.0
Commercial activities	26.5	30.1	30.5	16.0
Hotels and restaurants	43.3	5.7	36.4	5.0
Other tourism services	3.0	6.5	1.4	5.0
Other activities	3.0	18.7	14.9	15.0
Number of surveyed firms	111	123	154	125

sectors, such as tourism, where part-time or seasonal employment is a frequent occurrence (a usual and acceptable labour convention), and thus employment growth may be easily observed, and sectors like manufacturing, where employment has a more permanent character, yearly fluctuations are not sharp and employment growth in terms of new employees may be more difficult to occur. Small firms are more likely to increase the number of their employees than larger firms, and the observed employment growth may be misleadingly high as, for example, a small business with one employee can present a 100% growth by employing just one more employee.

To summarise the discussion so far, the a priori hypothesis is that certain human capital characteristics such as education, training, parental influence and locality will have a positive influence on firm growth, while the influence of work experience and managerial experience is inconclusive. From the range of control variables, the entrepreneur's age and the age and size of the business in terms of employment are assumed to have a negative effect on firm growth while hypotheses about the effect of the entrepreneur's gender and of the sector of economic activity are inconclusive.

Table 2 shows the definitions of the major human capital, and the business-specific and growth variables that were recorded in the questionnaire surveys and will be used in this work. The human capital variables capture both formal (EDUCATION, TRAINING) and informal processes (EXPERIENCE, MANAGERIAL EXPERIENCE, PARENTAL INFLUENCE, LOCAL). It should be noted that the variable EXPERIENCE represents work experience in a job relevant to the entrepreneur's present business, and the variable MANAGERIAL EXPERIENCE represents managerial experience in any kind of job. Thus, the two variables are not nested. Growth is measured in annual work units (AWU) and not in physical work units, in order to account for the widespread occurrence of seasonal and part-time employment. Thus, each part-time all-year-round employee or a full-time seasonal employee contributes 0.5 of an AWU, while a causal or a part-time seasonal employee contributes 0.25 of an AWU.

Table 3 presents the descriptive statistics of these variables in the four case study areas and in total. Formal processes of education and training are high in the Spanish region and very low in the Portuguese region. Work experience in a similar job is relatively high in all regions, but exceptionally high in the Portuguese case study area. Experience in management is very low in the case study area in Portugal, rising to only 14%. Entrepreneurs were raised in an entrepreneurial environment with at least one of the parents being an entrepreneur, to a high extent in the Spanish and Italian case study areas and, to a lesser extent, in the Greek and Portuguese case study areas. Finally, the overwhelming majority of entrepreneurs were raised and lived in the area in which they later established their businesses. The mean growth of employment in AWU varies from a low 0.49 AWU in the last 5 years in the Greek case study area to a high 11.9 AWU in the Spanish case study area, while the growth rate ranges

Table 2
Variable definition

Variable name	Description
Human capital variables	
EDUCATION	Dummy variable taking the value of 1 if respondent has completed at least the basic education and 0 otherwise
TRAINING	Dummy variable taking the value of 1 if respondent has undergone business training and 0 otherwise
EXPERIENCE	Dummy variable taking the value of 1 if respondent has work experience relevant to his/her present business and 0 otherwise
MANAGERIAL EXPERIENCE	Dummy variable taking the value of 1 if respondent has managerial experience and 0 otherwise
PARENTAL INFLUENCE	Dummy variable taking the value of 1 if at least one of the respondent's parents was an entrepreneur and 0 otherwise
LOCAL	Dummy variable taking the value of 1 if respondent has been raised and lived in the area and 0 otherwise
AGE	Respondent's age in years
SEX	Dummy variable taking the value of 1 if respondent is female and 0 if he is male
Business variables	
MANUFACTURING	Dummy variable taking the value of 1 if the business is active in the manufacturing sector and 0 otherwise
EMPLOYMENT	The firm's employment in AWUs in 1985
FIRM AGE	The firm's age in 2000 in years
Growth variables	
ABSOLUTE GROWTH	The absolute difference in AWUs in the last 5 years
GROWTH RATE	The rate of growth in AWUs in the last 5 years

Table 3
Descriptive statistics

Variable name	Mean (standard deviation)				
	Greece	Italy	Portugal	Spain	All
Human capital variables					
EDUCATION	0.60	0.52	0.10	0.77	0.47
TRAINING	0.18	0.17	0.07	0.52	0.23
EXPERIENCE	0.33	0.38	0.51	0.40	0.41
MANAGERIAL EXPERIENCE	0.06	0.09	0.14	0.05	0.09
PARENTAL INFLUENCE	0.31	0.64	0.29	0.54	0.44
LOCAL	1.00	0.60	0.60	0.62	0.48
AGE	43.90 (11.56)	47.27 (12.16)	49.77 (12.86)	44.21 (9.53)	46.52 (11.94)
SEX	0.16	0.25	0.23	0.13	0.20
Business-specific variables					
MANUFACTURING	0.22	0.33	0.16	0.59	0.32
EMPLOYMENT	3.84 (3.76)	4.80 (6.19)	2.18 (1.66)	9.77 (21.72)	5.03 (11.68)
FIRM AGE	14.05 (13.68)	16.13 (9.94)	15.51 (12.85)	16.20 (18.83)	15.52 (14.14)
Growth variables					
ABSOLUTE GROWTH	0.49 (2.10)	3.62 (8.27)	0.82 (2.25)	11.90 (24.20)	4.13 (13.50)
GROWTH RATE	25.98 (100.53)	71.26 (118.81)	39.02 (96.05)	327.62 (590.38)	114.60 (328.65)

from a spectacular 327.62% in the Spanish case study area to almost 26% in the Greek case study area. An inspection of the descriptive statistics reveals the multiplicity of human capital accumulation processes in operation in the different case study areas. Formal processes of human capital accumulation are strong in some areas, but weak in others where, in contrast, informal processes are strong. Finally, absolute and percentage growth varies enormously among the case study areas.

4. Results

Our first task is to examine differences in absolute growth and growth rates among businesses managed by entrepreneurs with different human capital characteristics and reveal any significant trends. Tables 4 and 5 show the mean absolute growth and the mean percentage growth rate, respectively, for businesses managed by entrepreneurs in one or the other category of a human capital variable. For each human capital variable in Tables 4 and 5, the first line shows whether the observed difference of the mean absolute growth (Table 4) or the percentage growth rate (Table 5) in the two categories of the variable is statistically significant. Because both the absolute growth and the percentage growth are regarded as continuous variables, the difference of the means in the two categories is tested with the non-parametric Mann–Whitney *U*-test, which is the non-parametric equivalent of the parametric t-test. The second line shows the mean absolute growth (Table 4) and the mean percentage growth rate (Table 5) for the businesses managed by entrepreneurs who do not possess the specific human capital characteristic. The third line shows the mean absolute growth (Table 4) and the mean percentage growth rate (Table 5) for the businesses managed by entrepreneurs who possess the specific human capital characteristic.

The differences in the means of absolute growth are statistically significant only for three human capital variables (EDUCATION, TRAINING, LOCAL) and only for the case study areas of Italy (EDUCATION, TRAINING, LOCAL) and Spain (TRAINING). The same picture is revealed when the differences in the means of percentage growth are considered. It was noted above, however, that business growth in terms of employment may depend on a wide range of control variables including business characteristics, such as the sector of economic activity, the initial business size, the firm's age, etc. Below, we consider a multivariate model that includes all the human capital characteristics as well as other control variables.

The basic objective when constructing a multivariate model is to examine the effects of the various human capital characteristics on the probability that a firm has grown. In other words, we are not interested so much in the actual growth (as this is extremely dependent on a wide range of variables), but in the probability that a firm has shown any growth at all. For this reason, the dependent variable is not the continuous (or quasi-continuous) absolute or percentage growth, but a dummy variable taking the value of one if the firm has shown any growth at all (irrespective of the magnitude of the growth), and zero if the firm has not increased (or if it has decreased) its employment rate in the last 5

Table 4
Growth among businesses with different human capital characteristics

Variable name	Greece	Italy	Portugal	Spain	All
EDUCATION	—	**	—	—	***
0	0.15	1.71	0.88	9.75	1.90
1	0.50	5.39	0.27	11.52	6.30
TRAINING	—	***	—	**	***
0	0.30	3.04	0.83	9.02	2.53
1	1.35	6.43	0.73	14.55	9.54
EXPERIENCE	—	—	—	—	—
0	0.10	3.00	0.26	10.41	3.95
1	0.44	4.11	0.92	11.42	3.98
MANAGERIAL EXPERIENCE	—	—	—	—	—
0	0.34	3.90	0.88	11.19	4.16
1	0.67	1.00	0.48	10.17	3.61
PARENTAL INFLUENCE	—	—	—	—	**
0	0.28	5.39	0.71	7.61	2.75
1	0.59	2.65	1.11	14.00	5.52
LOCAL	—	**	—	—	***
0	—	1.63	0.98	9.71	2.54
1	—	4.99	0.72	13.26	5.98

Note: One, two and three asterisks indicate statistical significance of the Mann–Whitney *U*-test at the 0.10, 0.05 and 0.01 levels, respectively.

Table 5
Percentage growth among businesses with different human capital characteristics

Variable name	Greece	Italy	Portugal	Spain	All
EDUCATION	—	**	—	—	***
0	22.80	59.81	41.45	240.15	63.80
1	25.17	82.22	16.56	351.58	172.60
TRAINING	—	***	—	*	***
0	20.53	60.40	39.87	246.32	72.26
1	50.19	124.01	28.03	402.68	257.18
EXPERIENCE	—	—	—	—	—
0	2.65	53.93	20.65	321.13	10.8.82
1	30.08	84.67	42.25	327.36	116.93
MANAGERIAL EXPERIENCE	—	—	—	—	—
0	22.84	75.45	40.93	337.79	122.17
1	41.67	32.42	26.98	88.65	38.17
PARENTAL INFLUENCE	—	—	—	—	*
0	17.33	71.21	37.45	372.67	106.36
1	41.24	71.77	42.95	275.92	123.94
LOCAL	—	*	—	*	***
0	—	57.54	30.68	270.10	79.05
1	—	80.98	44.50	363.48	156.54

Note: One, two and three asterisks indicate statistical significance of the Mann–Whitney *U*-test at the 0.10, 0.05 and 0.01 levels, respectively.

years. Due to the dummy nature of the dependent variable, the probit formulation of the multivariate model is appropriate. We estimate five probit models, one for each case study area and one for all the observations together. Separate tests examining the null hypothesis that individual coefficients are zero can be calculated by analogy with the *t*-test of the conventional multiple regression model. A joint test of the null hypothesis that all the parameters associated with the explanatory variables are equal to zero is a chi-squared test based on the maximised likelihood. A goodness-of-fit measure, based on the likelihood-ratio test statistic, usually reported as McFadden's ρ^2, pseudo-R^2 measure, or rho-square, is also computed. Maximum-likelihood estimated coefficients, their corresponding *t*-ratios, the chi-squared test, the ρ^2 goodness of fit measure and the percentage of correctly predicted cases are shown in Table 6. In the model including observations from all case study areas, we have included case study-specific dummies for the observations in Portugal (PORTUGAL), Spain (SPAIN) and Italy (ITALY) and, as is the usual practice in econometrics, we excluded the dummy for observations in the Greek case study area, in order to avoid multicollinearity. All models present a very good fit, as this is revealed by the chi-squared tests, the ρ^2 coefficient and the percentage of correctly predicted cases.

The sign of the estimated coefficients shows the direction of the change in the probability that a firm has increased employment in the last five years, i.e., it shows a positive change in absolute employment. However, the estimated coefficients do not show the magnitude of an independent variable's effects on the change in the probability of observing a positive change in employment. The marginal effects reported in Table 7 show how much the probability that a firm has increased employment, expressed in percentages, will change if the independent (explanatory) variable changes by a marginal amount from its sample mean. The marginal effect for the dummy independent variables is estimated as a difference between the variable's two values, i.e., 0 and 1 (Greene, 1998). For example, in the Greek case study area, an entrepreneur who has completed basic education (EDUCATION = 1) has 20.3% more probability to manage a firm that has increased its level of employment in the past 5 years than an entrepreneur who has not finished basic education, all other variables held constant at sample's means.

Thus, entrepreneurs who have completed basic education are more likely to manage a firm which has increased employment in the last 5 years in the Greek case study area and in total, but are less likely to do so in the Portuguese case study area. Training significantly increases the probability that the entrepreneur manages a growing business by 43.8% in Italy, 23.0% in Spain and 26.1% in total. Experience in a similar business is significant in the case study area of Italy, increasing the probability of managing a growing venture by 32.5%, and for the sample of all businesses, by 8.4%. Surprisingly, experience in management reduces the

Table 6
Coefficient estimates of probit models

Independent variables	Greece	Italy	Portugal	Spain	All
Constant	**−2.338****	**−2.569****	**1.805****	−1.263	**−1.000****
MANUFACTURING	0.094	**1.196****	0.410	0.330	**0.360****
EMPLOYMENT	0.015	**−0.056****	−0.136	**−0.019****	**−0.011***
FIRM AGE	−0.003	0.011	−0.006	**0.019****	0.005
AGE	**0.036****	0.026	**−0.023***	0.020	0.004
SEX	−0.451	0.124	**−0.581****	−0.147	**−0.378****
EDUCATION	**0.735****	0.619	**−0.817***	0.321	**0.335****
TRAINING	0.496	**1.310****	0.069	**0.701****	**0.668****
EXPERIENCE	0.349	**0.849****	0.032	−0.385	**0.213***
MANAGERIAL EXPERIENCE	**−1.432***	**−1.432****	−0.056	**1.165***	−0.294
PARENTAL INFLUENCE	−0.134	0.197	0.147	**0.482***	0.104
LOCAL	—	0.182	−0.136	0.089	0.063
PORTUGAL	—	—	—	—	**0.453****
SPAIN	—	—	—	—	**0.829****
ITALY	—	—	—	—	**0.681****
Log-L_Ω	−37.500	−61.707	−81.702	−62.977	−280.538
Log-L_ω	−49.485	−84.564	−94.769	−74.498	−330.090
$\chi^2(d,f_1)$	23.970(10)	45.71 (11)	26.134(11)	23.04 (11)	100.73(14)
ρ^2	0.242	0.469	0.138	0.154	0.152
% of correct predictions	80.68	71.31	66.66	76.86	70.27
Sample size	88	122	150	121	481

Note: Single and double asterisks indicate that the corresponding coefficients are significance at the 0.10 and 0.05 levels, respectively.

probability that the entrepreneur will manage a growing business by 22.5% in Greece and 46.7% in Italy, and has a positive contribution only in the case study area of Spain (24.4%). Finally, the family background is significant only in the case study area of Spain, while the strong association with the locality is not a significant human capital accumulation process in any of the case study areas.

The effect of the control variables is interpreted accordingly. The sector of economic activity is significant for the Italian case study. If the firm is active in the manufacturing sector, the probability that shows increased levels of employment in the last 5 years increases by 43.6%. The firm's initial size in terms of AWU is also important for the Italian and Spanish case study areas. An increase in the firm's initial size by one AWU reduces the probability that this firm has raised its level of employment in the last 5 years by 2.2% in the Italian and by 0.6% in the Spanish case study area. The firm's age exerts a significant and positive effect only in the Spanish case study area. An increase in the firm's age by 1 year adds to the probability that the firm has raised its level of employment in the last 5 years by 0.7%. Older entrepreneurs are more likely to manage growing business in Greece, but less likely to do so in Portugal. Finally, women entrepreneurs are less likely to manage growing business in Portugal than men.

In the model including all case studies, the interpretation of the country dummies is made relative to the base category, i.e., the Greek case study area. Thus, the probability that an entrepreneur located in the Portuguese case study area manages a growing business is 17.9% higher than a similar entrepreneur (all other variables held constant at sample's means) located in the Greek case study area. Similarly, the entrepreneurs located in Spain and Italy have a higher probability to manage growing businesses than their Greek counterparts by 32.1% and 26.6%, correspondingly.

Results from the above analyses show that various entrepreneurial human capital characteristics have a varied impact on the growth of businesses located in different lagging areas of Southern Europe. Human capital processes leading to the accumulation of codified knowledge, such as education and training and, to a lesser extent work, and managerial experience, generate a significant impact on business growth. Other human capital characteristics and especially those linked to non-cognitive acquisition of tacit knowledge, such as being raised in an entrepreneurial environment and being brought up in the area, do not significantly affect business success.

5. Discussion and policy implications

Taking into account the data restrictions of the present survey and its limited geographical coverage, the derived results are only indicative, should not be accepted uncritically, should not be generalised to hold true for other rural marginal and mountainous areas of the EU and no policy prescriptions may be based on their interpretation.

Table 7
Marginal effects of probit estimates

Independent variables	Greece	Italy	Portugal	Spain	All
MANUFACTURING	0.028	**0.436****	0.152	0.109	**0.142****
EMPLOYMENT	0.004	**−0.022****	−0.048	**−0.006****	**−0.004***
FIRM AGE	−0.001	0.004	−0.002	**0.006****	0.002
AGE	**0.010****	0.010	**−0.008***	0.007	0.001
SEX	−0.132	0.049	**−0.204****	−0.048	**−0.149****
EDUCATION	**0.203****	0.243	**−0.229***	0.111	**0.132****
TRAINING	0.162	**0.438****	0.025	**0.230****	**0.261****
EXPERIENCE	0.107	**0.325****	0.011	−0.129	**0.084***
MANAGERIAL EXPERIENCE	**−0.225***	**−0.467****	−0.020	**0.244***	−0.113
PARENTAL INFLUENCE	−0.039	0.078	0.052	**0.159***	0.041
LOCAL	—	0.072	−0.048	0.029	0.025
PORTUGAL	—	—	—	—	**0.179****
SPAIN	—	—	—	—	**0.321****
ITALY	—	—	—	—	**0.266****

Note: Single and double asterisks indicate statistical significance of the estimated marginal effects at the 0.10 and 0.05 levels, respectively.

However, results from the present study offer valuable insight into the nature of future entrepreneurial instruments within an integrated local and rural development strategy. One indication leads to the argument that a variety of processes of human capital and knowledge accumulation are case study specific. For example, despite the conventional view that well-educated and trained entrepreneurs are the base of entrepreneurial success, in the Portuguese case study, the successful entrepreneur is not well educated, has not undergone training, but is work experienced (Tables 4 and 5). In contrast, education and training are a very important component of success for entrepreneurs in the Greek, Italian and Spanish case study areas. A second example revealing the locality-specific effects of entrepreneurial human capital accumulation on business growth is derived from the effects of management experience on business growth. Managerial experience does not affect business growth in the Greek and Italian case study areas, but it does so in the Spanish case study area (Tables 6 and 7). The accumulation of knowledge acquired through managing a business increases risk aversion for entrepreneurs in Greece and Italy, but it assists entrepreneurs in Spain to reduce perceived risk. This may be attributed to a wide range of factors that are basically idiosyncratic, rooted in the entrepreneurs' personality and the surrounding social environment.

Another indication derived from this work is that human capital accumulation processes leading to the acquisition of mainly codified knowledge (education and training), or to the acquisition of both codified and tacit knowledge (work and managerial experience), still play the prime role in predicting successful businesses. In contrast, human capital accumulation processes leading to the acquisition of mainly tacit knowledge (being raised in an entrepreneurial environment and being a native of the area) do not contribute that much, and the importance that has been assigned to them may be questioned. Of course, it may be argued that tacit knowledge can only be useful if and when codified knowledge has been accumulated. In other words, cosmopolitan (codified) knowledge is a prerequisite if tacit knowledge is to contribute to a successful venture, and thus the mechanisms for ensuring the accumulation of codified knowledge are extremely important not only for codified knowledge per se but also for the appropriate and possible utilisation of accumulated tacit knowledge.

Our results and conclusions are only indicative, should not be accepted uncritically, should not be generalised to hold true for other rural areas of the EU and no general policy prescriptions may be based on their interpretation. Especially, the idiosyncratic nature of some of the findings, e.g., those referring to Portugal, may reflect more the data restrictions of this work than genuine processes taking place in remote and lagging areas. In rural lagging and mountainous areas, where agricultural activities are not usually competitive at cost terms, local entrepreneurship plays an important role in providing employment opportunities and increasing local incomes. Entrepreneurial human capital accumulation and learning should be supported by modern, flexibly tailored combinations of assistance using complex multi-instrument sets of support. Entrepreneurial strategies, policies and structures to promote/encourage/support the establishment and operation of successful ventures are desirable instruments of development in lagging regions. Strengthening human capital accumulation processes must become an extremely important step in an integrated entrepreneurial strategy. However, the multiplicity of human capital accumulation pathways and their differential effect on business growth calls for locally designed and implemented human capital support instruments.

The institutional aspect is not directly raised in this work, but there is evidence that central institutions have neither the resource to administer flexible support instruments nor the local knowledge and expertise necessary to understand the precise types of entrepreneurial support required in each area (Skuras et al., 2003a). One crucial entrepreneurial policy target would be to accelerate capacity building among local institutions, so that they will be able to design and implement flexible combinations of entrepreneurial policy instruments, with specific reference to human capital. Institutions should promote a participatory approach and enable local populations to articulate their ideas on rural development instruments, and design and implement entrepreneurial initiative, based on their subjective assessment of the availability for and need of certain mechanisms that support human capital accumulation, such as the provision of training programmes, the participation in the design of rural education programmes, the provision of work and managerial experience acquisition initiatives, etc.

Thus, entrepreneurial human capital support programmes should be de-centralised (devolution of entrepreneurial policies) in order to become more flexible and selective, and suit local idiosyncrasies and needs. Entrepreneurial human capital support policies can only be dealt with at a local and regional level and should be territorially defined, embracing both 'people development' and 'place development' (Skuras et al., 2000). In the most remote rural and mountainous areas of Southern Europe, the task of creating or enforcing the local institutional framework, a vital factor strengthening localised learning, represents a large political and administrative investment.

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